



Date : 26th of February 2012

Time : 0930 – 1230 hrs

Answer **Question 1**, the compulsory question, and **THREE** questions from Questions 2 – 6.

1) **COMPULSORY QUESTION**

USoft is a software solutions company providing IT consultancy services to large International businesses. USoft has fully fledged Software development & software testing teams that can provide resources to various projects that run in the organization. The company also has an overall quality assurance team that overlooks all the projects across the company.

Assume that you are an undergraduate who is undergoing your industrial training at the company and linked to a QA team lead, who assists you to get familiar with software testing and QA process.

The QA team is assigned to test a web based application developed for a university. There are number of features implemented in this application such as student registration, online payment of fees, online examinations etc. and you are assigned to test a student mark maintain page.

Functionality:

- Validate the user inputs and allow only entering Student NIC and Subject Marks.
 - Once the user entered the student NIC the system will display the student name and will allow user to select the subject from a drop down list.
 - The drop down list will compromise with the student registered subjects.
 - If the details are correct and submitted a message will be prompted saying “Marks added successfully”.
 - Student NIC and Marks fields should not be empty.
- a) State two test case design techniques you would use to write the test cases. Explain referring the examples from the given scenario. (4 Marks)
- b) State two advantages of using the test case design techniques mentioned in part (a) above. (4 Marks)

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- c) What would be the test cases that you are writing if QA lead asks you to write five test cases to cover the most critical scenarios from the given page? (10 Marks)
- d) Marks will be entered to a text box range from 0 to 100. What is the count of the minimum number of test cases using equivalence partitioning to test this scenario adequately? List the test conditions of those test cases. (4 Marks)
- e) What are the test types you recommend to test of this application based on the overall system? Select the best four test types from the below list. Justify your answer. (4 Marks)

Functional Testing
Regression Testing
Integration Testing
Acceptance Testing
Performance Testing
Security Testing
Internationalization Testing
Usability Testing
Accessibility Testing
Ad hoc Testing

- f) Justify why you have not selected each of the other listed test types for this particular scenario and give examples when/where these test types are mostly suited. (6 Marks)
- g) QA lead asks you why each developer could not assure the quality of the product without having a separate QA team. State two reasons for having a separate QA team for the project. Explain two responsibilities of a quality assurance team. (4 Marks)
- h) USoft is planning to improve their client base by becoming a certified organization. List down four quality standards you would suggest to the company leadership to introduce a proper quality process which can be used throughout the SDLC? (4 Marks)

You are allowed to make realistic assumptions when answering this question, but all assumptions needs to be clearly stated in the document. **[40 Marks]**

2)

- a) Explain the following requirement validation techniques by specifying their limitations and strengths. (4X3 = 12 Marks)
- i. Desk checking
 - ii. Walkthrough
 - iii. Inspection
- b) Compare and contrast the QA testing process in traditional projects and in agile projects (4 X 2 = 8 Marks)

[20 Marks]

3)

Write the correct answers (*i.e. Answers should be one line answers*) for the following questions:

- a) What is the approach is being used for situations wherein the prototype is first built based on the current stage of the design? (2 Marks)
- b) What is the testing can be done to validate *that the right system was built*? (2 Marks)
- c) What is the quality process or terminology used in testing "*Are you building the thing right*"? (2 Marks)
- d) What is the quality attribute that ensures that the product can be transferred from one environment to another? (2 Marks)
- e) What is the document that describes the behavior of the system to be developed? (2 Marks)
- f) State the testing associated for the iterative model is where the requirements keep coming and the product is developed iteratively for each requirement. (2 Marks)
- g) What is the method of software testing that tests the functionality of an application as opposed to its internal structures or workings? (2 Marks)
- h) What is the type of software testing that is used to find out defects related to bad design or bad implementation of the system by testing both functionality and the internal structure? (2 Marks)
- i) What describes the degree to which the source code of a program has been covered? (2 Marks)
- j) State the testing which is done after changes have been made to ensure that no unwanted changes were introduced. (2 Marks)

[20 Marks]

4)

Utop is a leading software development company which was not capable of meeting their software release deadlines frequently from a quite considerable time. The management decided to take necessary actions to find the cause for this problem and to remedy the situation. By doing a root cause analysis it is found, the reasons to miss the deadlines were some input not received from customer, or some bug not resolved till date or simply the development taking more time than planned

- a) Define "Root Cause" analysis and what are the benefits of root cause analysis in quality engineering? (5 Marks)
- b) Provide at least three tools which are used in root cause analysis? (3 Marks)
- c) Explain how you use one of the above mentioned tools to find out the causes for not resolving some bug till date in the above scenario. (5 Marks)
- d) State three possible causes identified in part (c) for the problem? (3 Marks)
- e) Explain the defect lifecycle stages briefly. (4 Marks)

[20 Marks]

5)

- a) Explain what is meant by formal requirement analysis? And list down two techniques used for formal requirement analysis through examples? (4 Marks)
- b) Define what is test planning and list down main areas in test plan and briefly describe what is included in each area? (6 Marks)
- c) Why QA need something called "Quality Metrics" and explain four Quality Metrics that are used in order to validate the software quality? (6 Marks)
- d) Explain the similarity and differences between system testing and acceptance testing. (4 Marks)

[20 Marks]

6)

- a) What is a risk and how it differs from an issue? (4 Marks)
- b) List down sample risks that you can identify in a Test plan. (2 Marks)
- c) State four major reasons for implementing software risk management. (5 Marks)
- d) Provide two examples of risks to software testing / software testing projects. (3Marks)
- e) Ravi is the QA Lead for an online banking project. He is currently working on the planning aspect for the project. Explain in detail the risk management process that Ravi should follow. (6Marks)

[20 Marks]